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THE MEXICAN EARTHQUAKE OF JANUARY 19TH OBSERVED  
AT THE LICK OBSERVATORY.

On the night of Friday, January 19th, the central part of Mexico was visited by a severe earthquake, which destroyed several lives, and did an immense amount of damage to buildings and other property.

This earthquake was observed at the Lick Observatory, some fifteen hundred miles from the region of greatest disturbance. At 10<sup>h</sup> 50<sup>m</sup> Mr. R. H. TUCKER, who was working with the meridian-circle, and had observed the transit of a star at 10<sup>h</sup> 41<sup>m</sup>, turned the telescope downward to the mercury-basin between the brick piers, for an observation of the nadir point. This, however, he found impossible. The mercury was oscillating from both north to south and east to west, with a period of about seven seconds. The full amplitude of the oscillation (doubled by reflection) could be estimated quite accurately by observing the excursion of the image of the cross-wires. It was very nearly 15''. After about five minutes the oscillations began to decrease, and at 11<sup>h</sup> 5<sup>m</sup> had fallen to about one fourth of their maximum value. At 11<sup>h</sup> 15<sup>m</sup> they were still perceptible, but were no longer regular; the reflected image would come to rest for a few moments, and then continue to swing. At 11<sup>h</sup> 30<sup>m</sup> the vibration had so nearly ceased that the nadir observation was made. No change was found in the position of the instrument.

It will be seen that the oscillations continued for the remarkable length of time of forty minutes. There was no wind at the time, or anything to cause an unusual disturbance. A similar, though less marked, phenomenon on a previous occasion had been followed by an earthquake, though not a severe one, and Mr. TUCKER was led to expect a proportionally stronger shock after the oscillations he had observed on this night — an expectation which fortunately was not realized. It was not until January 22d that the news of the earthquake in Mexico reached Mt. Hamilton.

The thirty-six-inch refractor, the twelve-inch refractor, and the Crossley reflector were all in use, while the oscillations observed by Mr. TUCKER were in progress, but no disturbance of these instruments was noticed. It seems to me probable that there was a bodily motion of the whole surface of the ground, which would not produce an angular displacement of a telescope,

though it might cause the mercury to swing in the manner observed by Mr. TUCKER. No accurate data respecting the times of the most severe shocks in Mexico have yet been obtained.

J. E. K.

#### THE BINARY STAR, OΞ 341.

In 1898 I called attention to the change which had taken place in the relative positions of the components of this double star, and at the same time showed that the character of the motion proved it to be a binary system.

It will be remembered that the observations of this star from 1846 to 1886 gave no certain indications of motion, and, in consequence, that its components had come to be regarded as relatively fixed, at a distance of about 0".40. The observations of the past two years, however, show that the motion is quite rapid at times. During the first half of 1898, the star appeared perfectly round with the thirty-six-inch refractor, even when very high powers were used. On several occasions when the seeing was very fine, I failed utterly to detect any indication of duplicity, and Professor AITKEN had the same experience. In the latter part of the same year the distance had increased, and a very slight elongation could be seen, the measured distance being 0".10, and in another year it had increased to nearly 0".20. From this it would seem that this pair will soon become again a comparatively easy object for large telescopes under good conditions.

When an elongation was first detected in the latter part of 1898, I thought there had been a change of quadrant, but this has not been confirmed. The present position-angle differs very little from that obtained by all the earlier observers. An examination of all the observations available at the present time shows that in all probability the two stars are actually very near each other at periastron, and that the line of sight lies nearly in the plane of the orbit. From this it will be seen that the determination of the elements of the orbit of this binary, when sufficient observations for the purpose are obtained, will depend very largely upon the distances at the various epochs, and it is scarcely necessary to add that accurate measures of the distance at frequent intervals during the periods of rapid change such as the present will be particularly useful for this purpose.

January 17, 1900.

W. J. HUSSEY.